

CLAIMS

1. Adjustment device for a Bowden cable arrangement
with a housing (10),
5 with a first threaded part (70), which is guided in the housing (10) such as to be torsionally resistant and axially movable, and which is to be coupled to the Bowden cable arrangement, and with a second threaded part (50), which is arranged in an axially resistant and rotatable manner in the housing (10) and is in threaded engagement with the first threaded part (70),
10 whereby the housing (10) has a projection (16) with an opening (13) and
whereby a sleeve (30) is provided for, which has an opening (32) for accommodating a sheath of the Bowden cable arrangement, whereby the sleeve (30) has a passage hole (36), through which a wire of the Bowden cable
15 arrangement can be guided to couple with the first threaded part (70) by guiding the wire through the opening (13) of the projection (16) of the housing (10), and whereby the sleeve (30) has a peripheral section (33) which, when the sleeve (30) is placed on the projection (16) of the housing (10), engages around the projection of the housing.
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2. Adjustment device according to Claim 1,
characterised in that
the opening (32) provided to accommodate the sheath of the Bowden cable arrangement is formed at one longitudinal end of the sleeve (30) and the
25 peripheral section (33) at another longitudinal end of the sleeve (30).
3. Adjustment device according to Claim 1 or 2,
characterised in that
the sleeve (30) has a stop surface for the sheath of the Bowden cable
30 arrangement.
4. Adjustment device according to Claim 3,

characterised in that

the stop surface for the sheath of the Bowden cable arrangement has the passage hole (36) for the wire of the Bowden cable arrangement.

5 5. Adjustment device according to Claim 3 or 4,

characterised in that

the stop surface for the sheath of the Bowden cable arrangement runs essentially perpendicular to the longitudinal axis of the sleeve (30).

10 6. Adjustment device according to any one of Claims 3-5,

characterised in that

the stop surface for the sheath of the Bowden cable arrangement is formed by a projection (35), which projects into the peripheral section (33) in such a way that, when the sleeve (30) is placed on the projection (16) of the housing (10), the

15 projection (35) of the sleeve (30) projects into the opening (13) of the projection of the housing.

7. Adjustment device according to Claim 6,

characterised in that

20 the projection (16) of the housing (10), when the sleeve (30) is placed in position, is held in positive fit in an indentation (34) formed between the peripheral section (33) and the projection (35) of the sleeve (30).

8. Adjustment device according to Claim 6 or 7,

25 characterised in that

the projection (35) of the sleeve (30) has an essentially circular cross-section.

9. Adjustment device according to any one of the foregoing claims,

characterised in that

30 the projection (16) of the housing (10) and the peripheral section (33) of the sleeve (30) have an essentially circular cross-section.

10. Adjustment device according to any one of the foregoing claims,
characterised in that
the sleeve (30) is designed to be rotationally symmetrical in relation to its
longitudinal axis.

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11. Adjustment device according to any one of the foregoing claims,
characterised in that
ribs (37) for fixing the sheath of the Bowden cable arrangement in the opening
(32) of the sleeve (30) are formed in the opening (32) of the sleeve (30), which is
provided so as to accommodate the sheath of the Bowden cable arrangement.

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12. Adjustment device according to any one of the foregoing claims,
characterised in that
in a side wall of the housing (10) a further opening (14) is formed, which is
connected with the opening (13) in the projection (16) of the housing (10) via a
slot (15), and
that the peripheral section (33) of the sleeve (30) is designed in such a way that,
when the sleeve (30) is placed on the projection (16) of the housing (10),
deformation of the slot (15) of the housing (10) and of the opening (13) formed in
the projection (16) of the housing (10) is avoided when the adjustment device is
actuated.

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13. Adjustment device according to any one of the foregoing claims,
characterised in that
the opening (32) provided in order to accommodate the sheath of the Bowden
cable arrangement is formed in a closed circumferential edge of an
accommodation section (31) of the sleeve (30).

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14. Adjustment device for a Bowden cable arrangement
with a housing (10),
with a first threaded part (70), which is guided in the housing (10) such as to be
torsionally resistant and axially movable, and which is to be coupled to the

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Bowden cable arrangement, and with a second threaded part (50), which is arranged in an axially resistant and rotatable manner in the housing (10) and is in threaded engagement with the first threaded part (70),

5 whereby the first threaded part (70) and the second threaded part (50) in each case have thread sections (75; 33) which are in threaded engagement with one another, and whereby the first threaded part (70) and the second threaded part (50) in each case have a stop (82, 83; 61, 63) for the other threaded part, located on the threaded section adjoining the individual threaded section (73; 53) in each case.

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15. Adjustment device according to Claim 14, characterised in that

the stops (82, 83; 61, 63) of the first and second threaded part (70; 50) delimit a movement between the first and second threaded part in both the circumferential
15 direction as well as in the axial direction of the adjustment device.

16. Adjustment device according to Claim 14 or 15, characterised in that

one threaded part of the first and second threaded parts is a threaded spindle
20 (70) with an outer thread (73), and the other threaded part of the first and second threaded parts is essentially a hollow cylinder in form, with an inner thread (53), whereby the outer thread (73) of the threaded spindle (70) is in threaded engagement with the inner thread (53) of the other hollow-cylinder threaded part (50).

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17. Adjustment device according to Claim 16, characterised in that

the threaded spindle (70) has at a thread-free end section (82) at least one projection (83), which defines at least one stop surface.

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18. Adjustment device according to Claim 17, characterised in that

the at least one projection (83) at the thread-free end section (82) of the threaded spindle (70) defines both a stop surface which takes effect in the circumferential direction of the threaded spindle (70) and a stop surface which takes effect in the axial direction of the threaded spindle (70).

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19. Adjustment device according to Claim 17 or 18,
characterised in that

the height of the at least one projection (83) at the thread-free end section (82) of the threaded spindle (70) increases gradually in the circumferential direction of the threaded spindle (70).

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20. Adjustment device according to any one of Claims 17-19,
characterised in that

the threaded spindle (70) at the thread-free end section (82) has at least two diametrically-opposed projections (83) as stops.

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21. Adjustment device according to any one of Claims 16-20,
characterised in that

the threaded spindle (70) has at least one nose-shaped projection (78) at one thread-free end section (71), which defines at least one stop surface.

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22. Adjustment device according to Claim 21,
characterised in that

the at least one nose-shaped projection (78) of the thread-free end section (71) of the threaded spindle (70) defines a stop surface taking effect both in the circumferential direction of the threaded spindle (70) as well as in the axial direction of the threaded spindle (70).

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23. Adjustment device according to Claim 21 or Claim 22,
characterised in that

the at least one nose-shaped projection (78) is provided with at least one rib (79).

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24. Adjustment device according to Claim 23,
characterised in that
the at least one rib (79) is formed on one upper side of the at least one nose-
shaped projection (78) and the at least one stop surface is formed on an under
5 side of the at least one nose-shaped projection (78).

25. Adjustment device according to Claim 23 or Claim 24,
characterised in that
the at least one rib (79) has at least one elevation (80).

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26. Adjustment device according to Claim 25,
characterised in that
the at least one elevation (80) of the at least one rib (79) is directed in the axial
direction of the threaded spindle (70), so that the at least one rib (79) interacts
15 with the at least one elevation (80) as a stop against an inner wall of the housing
(10).

27. Adjustment device according to any one of Claims 23-26,
characterised in that
20 the threaded spindle (70) has at least two diametrically-opposed nose-shaped
projections (78) with in each case several wave-shaped ribs (79) arranged next to
one another in the circumferential direction of the threaded spindle.

28. Adjustment device according to any one of Claims 16-27,
25 characterised in that
the threaded part (50), essentially a hollow cylinder in form, has at least one
projection (61) at one thread-free end section , with its height increasing gradually
in the circumferential direction, whereby the at least one projection (61) defines a
stop surface taking effect in the circumferential direction as well as a stop surface
30 taking effect in the axial direction.

29. Adjustment device according to any one of Claims 14-28,

characterised in that

the stops (82, 83; 61, 63) of the first threaded part (70) and of the second threaded part (50) are designed in such a way that positive-fit stop surfaces are defined by the stops between the first threaded part (70) and the second thread part (50).

30. Adjustment device for a Bowden cable arrangement with a housing (10),

with a first threaded part (70), which is guided in the housing (10) such as to be torsionally resistant and axially movable, and which is to be coupled to the Bowden cable arrangement, and with a second threaded part (50), which is arranged in an axially resistant and rotatable manner in the housing (10) and is in threaded engagement with the first threaded part (70),

whereby a threaded part of the first and second threaded parts has a threaded spindle (70) with an outer thread (73), which is in threaded engagement with an inner thread (53) of the other threaded part (50), and whereby the outer thread (73) of the threaded spindle (70) has at least two threaded sections, separated in the circumferential direction of the threaded spindle (70) by thread-free sections (74).

31. Adjustment device according to Claim 30,

characterised in that

the thread-free sections (74) run in groove form in the longitudinal direction of the threaded spindle (70).

32. Adjustment device according to Claim 30 or Claim 31,

characterised in that

the at least two threaded sections of the outer thread (73) of the threaded spindle (70) are distributed uniformly over the circumference of the threaded spindle (70).

33. Adjustment device according to any one of Claims 30-32,

characterised in that

the at least two threaded sections of the outer thread (73) of the threaded spindle (70) extend in the longitudinal direction of the threaded spindle (70) essentially over the same length, and in the circumferential direction of the threaded spindle (70) extend essentially over the same angle.

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34. Adjustment device according to any one of Claims 30-33, characterised in that the outer thread (73) of the threaded spindle (70) is subdivided into three thread sections separated by the thread-free sections (74).

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35. Adjustment device according to any one of Claims 30-34, characterised in that the threaded spindle (70) is the first threaded part to be connected to the Bowden cable arrangement.

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36. Adjustment device according to any one of Claims 30-35, characterised in that the other threaded part (50) is essentially a hollow cylinder in form.

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37. Adjustment device for a Bowden cable arrangement with a housing (10), with a first threaded part (70), which is guided in the housing (10) such as to be torsionally resistant and axially movable, and which is to be coupled to the Bowden cable arrangement, and with a second threaded part (50), which is arranged in an axially resistant and rotatable manner in the housing (10) and is in threaded engagement with the first threaded part (70), whereby the first threaded part (70) is guided in the housing (10) in the longitudinal direction along at least one guide groove (17), whereby the at least one guide groove (17) is delimited by projections (18) projecting from an inner wall of the housing (10), and whereby a material cut-out (19) is provided between adjacent projections (18) in the circumferential direction of the housing (10), on one side of the projections on

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which the projections (18) do not delimit the at least one guide groove (17).

38. Adjustment device according to Claim 37,
characterised in that

- 5 the first threaded part (70) has at least one nose-shaped projection (78), which is
guided in the at least one guide groove (17) of the housing (10) in the longitudinal
direction of the housing.

39. Adjustment device according to Claim 37 or Claim 38,

- 10 characterised in that

the projections (18) run in the longitudinal direction of the housing (10).

40. Adjustment device according to any one of Claims 37-39,
characterised in that

- 15 the first threaded part (70) has at least two nose-shaped projections (78) which
are guided in at least two guide grooves (17) running in the longitudinal direction
of the housing (10), and
that in each case a material cut-out (19) is provided between two adjacent
projections (18) in the circumferential direction of the housing (10) on one side of
20 the projection on which the projections (18) do not delimit one of the guide
grooves (17).

41. Adjustment device according to any one of Claims 37-40,
characterised in that

- 25 the material cut-out (19) between the adjacent projections (18) is of such a nature
that the adjacent projections (18) are not connected to one another over their
entire length in the longitudinal direction of the housing (10).

42. Adjustment device according to any one of Claims 37-41,

- 30 characterised in that

the material cut-out (19) between the adjacent projections (18) is of such a nature
that the adjacent projections (18) are separated from one another over their

entire length in the longitudinal direction of the housing (10).

43. Adjustment device according to any one of Claims 37-42, characterised in that

- 5 the first threaded part (70) has at least one nose-shaped projection (78) which is guided in the at least one guide groove (17) of the housing (10) and has at least one rib (79) projecting from the nose-shaped projection (78).

44. Adjustment device according to Claim 43,

- 10 characterised in that

the at least one rib (79) of the at least one nose-shaped projection (78) has at least one elevation (80) directed in the longitudinal direction of the first threaded part (70).

- 15 45. Adjustment device according to Claim 43 or Claim 44 characterised in that the at least one rib is wave-shaped.

46. Adjustment device according to any one of Claims 43-45,

- 20 characterised in that

the at least one nose-shaped projection (78) of the first threaded part (70) has several ribs (79) arranged next to one another in the circumferential direction of the first threaded part (70).

- 25 47. Adjustment device for a Bowden cable arrangement with a housing (10),

with a first threaded part (70), which is guided in the housing (10) such as to be torsionally resistant and axially movable, and which is to be coupled to the Bowden cable arrangement, and with a second threaded part (50), which is

30 arranged in an axially resistant and rotatable manner in the housing (10) and is in threaded engagement with the first threaded part (70),

whereby the first threaded part (70) has at one longitudinal end an opening (77)

for a wire of the Bowden cable arrangement in such a way that the wire can be guided in the longitudinal direction of the first threaded part (70) via an opening (77) into the first threaded part (70), in order to be connected there to the first threaded part (70), and

- 5 whereby positioning means (84) are provided in the opening (77) of the first threaded part (70) for the positioning of the wire in the opening (77).

48. Adjustment device according to Claim 47,
characterised in that

- 10 the positioning means comprise several projections (84) projecting from an inner wall of the first threaded part (70).

49. Adjustment device according to Claim 48,
characterised in that

- 15 the projections (84) are designed in the form of ribs.

50. Adjustment device according to Claim 48 or Claim 49,
characterised in that

- the projections (84) are arranged distributed uniformly in the circumferential
20 direction of the first threaded part (70) along the inner wall of the first threaded part (70).

51. Adjustment device according to any one of Claims 47-50,
characterised in that

- 25 the positioning means comprise four projections (84) projecting from the inner wall of the first threaded part (70).

52. Adjustment device according to any one of Claims 47-51,
characterised in that

- 30 a further opening (75) is provided in a side wall of the first threaded part (70), which is connected with the hole (77) formed at the longitudinal end of the first threaded part (70) by means of a slot (76) formed in the side wall.

53. Adjustment device according to any one of Claims 47-52,
characterised in that

the positioning means (84) are designed in such a way that they retain the wire
5 essentially centrally in the opening (77) formed in the longitudinal end of the first
threaded part (70).

54. Adjustment device for a Bowden cable arrangement
with a housing (10),

10 with a first threaded part (70), which is guided in the housing (10) such as to be
torsionally resistant and axially movable, and which is to be coupled to the
Bowden cable arrangement, and with a second threaded part (50), which is
arranged in an axially resistant and rotatable manner in the housing (10) and is in
threaded engagement with the first threaded part (70),

15 whereby a threaded part of the first and second threaded parts is a threaded
spindle (70) with an outer thread (73), which is in threaded engagement with an
inner thread (53) of the other threaded part,

whereby the other threaded part is formed by several part-shell elements (50),
whereby threaded sections of the inner wall (53) are formed on the inner walls of
20 the part-shell elements (50), and

whereby the threaded sections of the inner wall (53) are formed at separation
surfaces of the part-shell elements (50), and
whereby at separation surfaces of the part-shell elements (50) the threaded part
sections are rounded off.

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55. Adjustment device according to Claim 54,
characterised in that

at the separation surfaces of the part-shell elements (50) in each case a
combination is formed of a projection (55, 57) and an indentation (56, 58), such
30 that the projection (55, 57) at the separation surface of one of the part-shell
elements (50) can engage in the indentation (56, 58) at the separation surface of
another of the part-shell elements (50).

56. Adjustment device according to Claim 55,

characterised in that

each part-shell element (50) has two separation surfaces, in each case with a
5 combination of a projection (55, 57) and an indentation (56, 58), whereby the
sequence of the projection (55) and the indentation (58) of the one separation
surface in the longitudinal direction of the corresponding part-shell element (50) is
opposed to the sequence of the projection (57) and the indentation (56) of the
other separation surface of the corresponding part-shell element (50).

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57. Adjustment device according to Claim 55 or Claim 56,

characterised in that

the at least one combination of projection (55, 57) and indentation (56, 58) in
each part-shell element (50) is provided in the area of the corresponding
15 threaded part section (53).

58. Adjustment device according to any one of Claims 54-57,

characterised in that

the part-shell elements (50) are retained axially secure in the housing (10) by an
20 engagement connection.

59. Adjustment device according to Claim 58,

characterised in that

the engagement connection of the individual part-shell elements (50) comprise
25 projections (59) projecting outwards, which engage in an indentation formed in an
inner wall of the housing (10).

60. Adjustment device according to Claim 59,

characterised in that

the projections (59) projecting outwards from the part-shell elements (50) are
30 formed in the area of the threaded part sections (53) on the outer sides of the
part-shell elements (50).

61. Adjustment device according to any one of Claims 54-60,
characterised in that
the threaded spindle (70) is the first threaded part, while the part-shell elements
5 (50) form the second threaded part.

62. Adjustment device for a Bowden cable arrangement
with a housing (10),
with a first threaded part (70), which is guided in the housing (10) such as to be
10 torsionally resistant and axially movable, and which is to be coupled to the
Bowden cable arrangement, and with a second threaded part (50), which is
arranged in an axially resistant and rotatable manner in the housing (10) and is in
threaded engagement with the first threaded part (70),
whereby a threaded part of the first and second threaded parts is a threaded
15 spindle (70) with an outer thread (73), which is in threaded engagement with an
inner thread (53) of the other threaded part, and
whereby at least one opening (81) is formed in the threaded spindle (70) for
holding the threaded spindle (70) in position during the manufacture of the
spindle (70).

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63. Adjustment device according to Claim 62,
characterised in that
the at least one opening (81) is formed in a side wall of the threaded spindle (70)
in a thread-free section (71) of the threaded spindle (70).

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64. Adjustment device according to Claim 63,
characterised in that
the thread-free section is a head section (71) of the threaded spindle (70).

30 65. Adjustment device according to any one of Claims 62-64,
characterised in that
the at least one opening (81) for holding the threaded spindle (70) in position

during the manufacture of the threaded spindle (70) is located opposite a further opening (75) in the threaded spindle (70) to introduce the wire of the Bowden cable arrangement.

5 66. Adjustment device according to any one of the foregoing claims,
characterised in that
the first threaded part (70) is a threaded spindle with an outer thread (73) and the
second threaded part (50) is a hollow cylinder in form, with an inner thread (53)
which is in threaded engagement with the outer thread (73) of the threaded
10 spindle.

67. Adjustment device according to Claim 66,
characterised in that
the second threaded part (50), in the form of a hollow cylinder, is formed by two
15 half-shell elements, whereby threaded part sections (53) of the inner thread of the
second threaded part are formed on inner walls of the half-shell elements.

68. Adjustment device according to Claim 67,
characterised in that
20 the two half-shell elements (50) are held in an axially secure manner in the
housing (10) by projections (59) which project from outer sides of the half-shell
elements (50).

69. Adjustment device according to any one of the foregoing claims,
25 characterised in that
the housing (10) and the first threaded part (70) in each case have an opening
(14; 75) formed in a corresponding side wall and an axial opening (13; 77) formed
on a corresponding longitudinal end, which are connected via a slot (15; 76)
formed in the corresponding side wall with the opening (14; 75) formed in the
30 corresponding side wall.

70. Adjustment device according to any one of the foregoing claims,

characterised in that

the second threaded part (50) can be connected to an actuating element for rotating the second threaded part (50) in the housing (10).

- 5 71. Adjustment device according to any one of the foregoing claims,
characterised in that
the housing (10) is made of a polyamide plastic.

72. Adjustment device according to any one of the foregoing claims,
10 characterised in that
the first threaded part (70) is made of a polybutylene terephthalate plastic.

73. Adjustment device according to any one of the foregoing claims,
characterised in that
15 the second threaded part (50) is made of a polyoxymethylene plastic.